

## 11. Teresa

**Program Name:** Teresa.java

**Input File:** teresa.dat

Teresa’s big sister has been learning about matrix operations in her college math class. She doesn’t really understand many of the details but has decided to try programming an experimental operation as a personal challenge; however, she is struggling. She is trying to perform a 2-way sort of a matrix so the smallest value is in the top left corner and the largest value is in the bottom right corner. Her experimental operation first sorts within the columns and then across the rows. The result should be that the values increase from left-to-right and top-to-bottom as shown in the following example.

Original Matrix				Columns Sorted				Final Matrix			
73	95	72	15	23	21	22	15	15	21	22	23
47	21	41	66	37	28	38	39	28	37	38	39
23	61	38	87	47	60	41	49	41	47	49	60
98	28	57	39	73	61	57	66	57	61	66	73
37	60	22	49	98	95	72	87	72	87	95	98

Can your UIL team help Teresa with this sorting challenge?

**Input:** First line will contain a number  $1 \leq T \leq 10$  as the number of test cases. The first line of each test case will contain two whole numbers R and C, the number of rows and columns in the matrix, both will be  $\geq 2$  and  $\leq 25$ . The following R rows will each contain exactly C integers, separated by white space, which is the data for the matrix. All data values will be  $\geq 100$  and  $< 1000$ .

**Output:** For each test case, output one line containing the test case number followed by a colon. The next R rows display the data in the columns of the sorted matrix as shown below, with exactly one tab following each data value. Below each test case, display a single line containing 12 plus signs, “+++++++”

**Sample input:**

```

2
5 4
194      819      449      405
560      410      914      534
302      670      856      448
933      239      259      477
591      455      665      652
3 5
558      777      773      761      995
252      632      580      639      818
590      828      372      386      489

```

**Sample output:**

```

1:
194      239      259      405
302      410      448      449
455      477      560      665
534      591      670      856
652      819      914      933
+++++++
2:
252      372      386      489      632
558      580      639      777      818
590      761      773      828      995
+++++++

```